



TABLE OF CONTENTS

Chapter 1: Hardware	1-1
Introduction	1-2
Conventions Used	1-2
Product Overview	1-3
Managed Switch Accessories	1-5
General Information	1-6
LED Indicators	1-9
Installation, Plastic Case Switches	1-11
Installation, Metal Case Switches	1-12
Power and Alarm Wiring	1-25
Communication Ports Wiring	1-27
Technical Specifications	1-31
Chapter 2: Managed Switch Quick Start	2-1
Connecting to the Switch for the first time	2-2
Connecting to the switch over Ethernet:	2-2
Setting up PC for USB connection to switch:	2-7
PC to switch using Serial Port:	2-8
USB and Serial connection to switch with Terminal Software Program:	2-9
Default Setup	2-13
Why might you need a Managed Switch?	2-16
Enhanced traffic filtering:	2-16
Troubleshooting:	2-16
Redundancy:	2-16
Security:	2-17
Better Network 'Awareness':	2-18

Chapter 3: Managed Switch Software Monitoring	3-1
System Information	3-2
Port and Power Status	3-4
Network Statistics	3-5
Spanning Tree Status	3-8
Real-Time Ring Status	3-10
Multicast Filtering Status	3-11
IGMP Port Status:	3-11
IGMP Group Status:	3-12
MAC Table	3-13
Configuration Summary	3-14
Chapter 4: Managed Switch Software Setup	4-1
Main Settings	4-2
System Settings	4-2
Remote Access Security	4-4
Port Settings	4-6
Port Mirroring	4-8
Set IP per Port	4-9
Switch Time Settings	4-10
Manage Firmware	4-11
Install Firmware	4-12
Redundancy Settings	4-14
Spanning Tree Settings	4-18
Spanning Tree Port Settings	4-21
Real-Time Ring Settings	4-23
RSTP Examples	4-24
Traffic Priority (Priority Queuing QoS, CoS, ToS/DS)	4-29
QoS / CoS Settings	4-30
802.1p Tag Settings	4-31
Message Rate Limiting	4-32
QoS Example	4-33
Multicast Filtering (IGMP)	4-36

IGMP Protocol Settings	4-37
Port Settings.	4-38
IGMP Example	4-39
Virtual LANs (VLANs).	4-40
VLAN Settings	4-41
VLAN Port Settings.	4-43
VLAN with RSTP.	4-44
VLAN Examples	4-46
Security Settings	4-51
Remote Access Security	4-51
Port Security Enables and Port Security MAC Entries	4-52
IPsec Settings	4-54
IKE Policy	4-57
IKE Pre-shared Keys	4-59
IKE Certificates	4-60
Monitoring Settings	4-62
Alarm (OK) Output.	4-62
Modbus	4-63
Register Mapping:	4-64
SNMP Notifications	4-65
Chapter 5: Managed Switch Software Advanced Operations	5-1
Configuration Management	5-2
Restore Factory Defaults	5-4
Reset Switch.	5-5
Update Firmware.	5-6
Update Firmware using a TFTP Server:	5-6
Appendix A: Troubleshooting	A-1
Troubleshooting Fiber Connections:	A-2
Troubleshooting Real-Time Ring.	A-4
Troubleshooting VLANs.	A-6
Installing Switch Firmware	A-8

Appendix B: Glossary	B-1
Glossary of Terms	B-2
Appendix C: Switch Settings	C-1
General Switch Information	C-2
Alarm Configuration	C-2
Mirror Configuration	C-3
VLAN Configuration	C-3
Port Configuration	C-3
QoS Configuration	C-3
Appendix D: CLI Commands	D-1
Introduction	D-2
Accessing the CLI	D-2
CLI Commands:	D-3
Global Commands:	D-3
Access Configuration:	D-3
Alarm Configuration:	D-4
Modbus Configuration:	D-4
Info Configuration:	D-4
Network Configuration:	D-5
Ring Configuration:	D-6
RSTP Configuration:	D-7
QoS Configuration:	D-7
VLAN Configuration:	D-8
IGMP Configuration:	D-9
Checkpoint Configuration:	D-9
Firmware Configuration:	D-9
TFTP Configuration:	D-9
Timezone Configuration:	D-10
MSTI Configuration:	D-10
General Configuration:	D-10

Appendix E: License Agreements	E-1
Overview	E-2
PCRE Library	E-2
libpcap Software	E-3
lighttpd Software	E-3
spawn-fcgi Software	E-4
ipsec-tools Software	E-4
net-snmp Software	E-6
FastCGI Library	E-11
watchdog Software	E-12
GPLv2 (General Public License v2)	E-12
Crossbrowser/x-tools Library	E-18
OpenSSL License	E-30
Open SSH License	E-32
PPP License	E-33
Shadow License	E-39
Sudo License	E-41
 Appendix F: Security Considerations for Control Systems Networks . F-1	
Security Considerations for Control Systems Networks.	F-2

